What is claimed is:

1. A method for determining whether any of a predetermined set of tones present in a plurality of successive frames of digital samples of a received signal falls within a predetermined frequency tolerance, comprising the steps of:

obtaining discrete Fourier transform pairs of in-phase and quadrature dot products of said samples and integer multiples of a base frequency;

determining the phase angle for the highest power ones of said products obtained on successive frames; and

subtracting an offset phase from the phase angle of said highest power ones of said products to determine the deviation of an observed tone from said predetermined frequency tolerance.

2. A method for determining said tones according to claim 1, wherein phase angles are computed by finding the arc tangent of said quadrature and in-phase dot products on successive ones of said frames.

3. A method for determining said tones according to claim 2, wherein the phase angle corresponding to said arc tangent is approximated as the quotient of the quadrature and in-phase products for small absolute values of the quotient.

4. A method for determining said tones according to claim 2, wherein said offset phase is proportional to the difference between an integer multiple of said base frequency and the closest one of said set of tones.

5. A method for determining said tones according to claim 2, wherein a change in said phase angle between successive frames of said waveform is computed.

6. A method for determining said tones according to claim 5, wherein the amplitude of a detected tone is compensated by a multiplicative correction of x/Sin(x) based upon the frequency deviation (x) of the observed tone from a tone of said set.

7. A method for determining said tones according to claim 3, wherein said approximation of said arc tangent function Theta is performed as follows:

a. for I >= 0, Q >= 0, AI > AQ, and 0 <= Theta <= π/4,

Theta = Theta1;

b. for I >= 0, Q >= 0, AI < AQ, and π/4 <= Theta <= π/2,

Theta = π/2 – Theta1;

c. for I < 0, Q >= 0, AI > AQ, and 3/4π <= Theta <= π,

Theta = π – Theta1;

d. for I < 0, Q >= 0, AI < AQ , and π/2 <= Theta <= 3/4π,

Theta = π/2 + Theta1;

e. for I >= 0, Q < 0, AI > AQ, and -π/4 <= Theta <= 0,

Theta = -Theta1;

f. for I >= 0, Q < =, AI < AQ, and -π/2 <= Theta <= -π/4,

Theta = -π/2 + Theta;

g. for I < 0, Q < 0, AI > AQ, and -π < Theta <= -3/4π,

Theta = -π + Theta1; and

h. for I < 0, Q < 0, AI < AQ, and -3/4π <= Theta <= -π/2,

Theta = -π/2 – Theta1;

where I is the in-phase component; Q is the quadrature component; AI is the absolute value of I; AQ is the absolute value of Q; Theta 1 is the absolute value of AQ/AI.